E. F. Codd on: Mastering the Art of Database Fusion page 61

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FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

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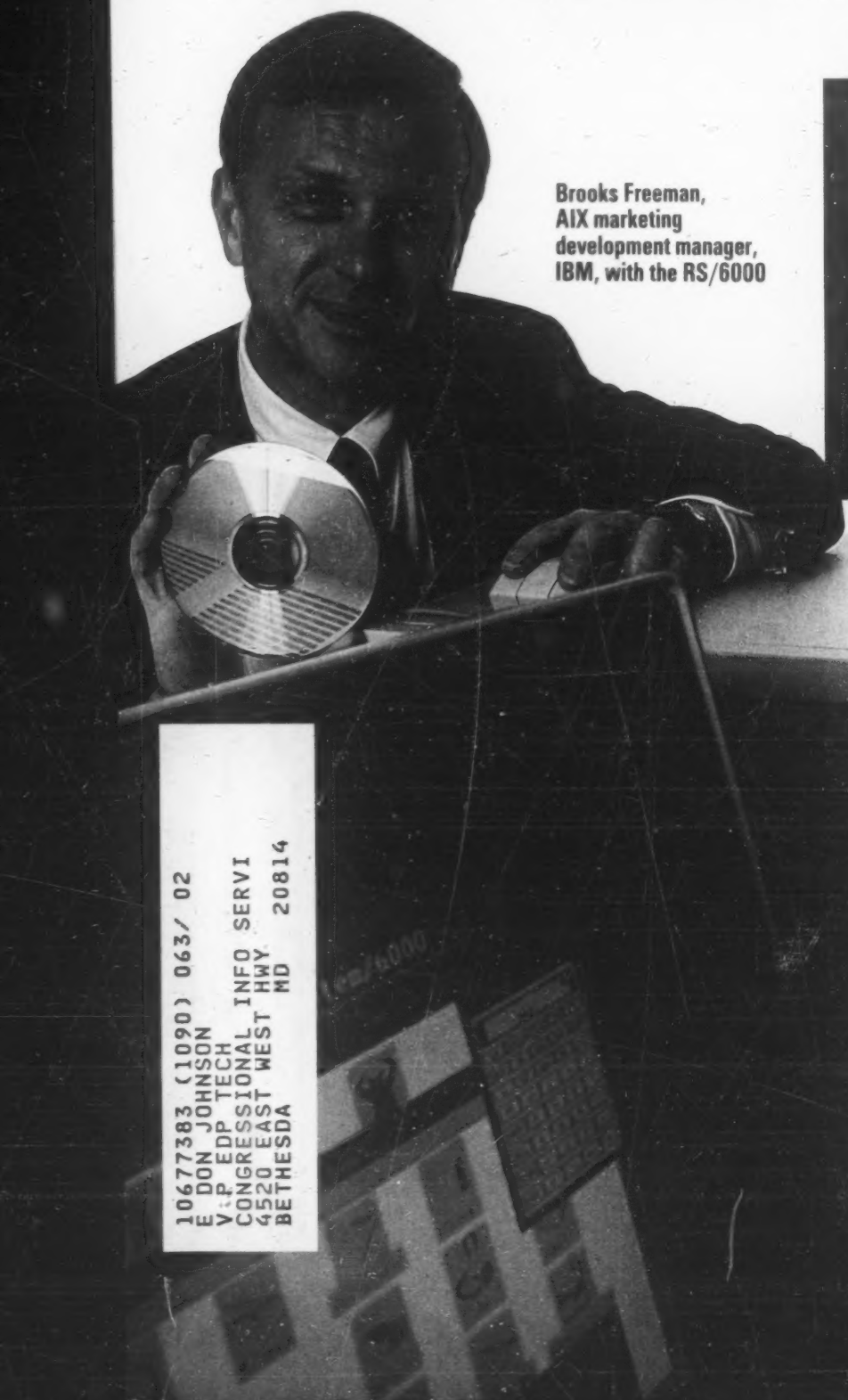

Brooks Freeman, AIX marketing development manager, IBM, with the RS/6000

Big Blue's Red Hot Workstation

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Apple's Sequel To SQL page 33

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DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

The RS/6000 reestablishes IBM's lead in the RISC world.

COVER STORY

Big Blue's Red Hot Workstation 28

BY BOB FRANCIS Bred for speed and compatibility, IBM's impressive new RS/6000 workstation is stirring widespread interest across the computing spectrum. But not all IS managers are convinced that IBM's latest RISC is a sure bet.

Cover photography by Peter Silvia Jr./Black Star

PCs & WORKSTATIONS

CONNECTIVITY

Apple's Sequel to SQL 33

BY JEFF MOAD Apple Computer was so impressed with the capabilities of the CL/1 connectivity language that it bought the company that invented it. Now Apple has to decide whether to promote the product as just a Macintosh or an industrywide solution.

PRODUCT GUIDE

SQL Server Power! 83

BY MIKE RICCIUTI DataEase SQL enables users to move between databases in a client/server architecture.

DataEase's Barca-Hall welcomes queries.

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MAINTENANCE

A Do-It-Yourself Guide to PC Repair 39

BY DENISE WORHACH Shocked by the size of your PC maintenance bill? Look to Novell, Auburn University and the Tennessee Valley Authority for examples of efficient, self-run maintenance departments.

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ELECTRONIC MAIL

Mail Messages That Cut Red Tape 47

BY STEPHEN A. CASWELL Now that it has glued five separate e-mail systems together, Hughes Aircraft is setting up an electronic forms-routing and approval system that will speed up business processes.

DATA STORAGE

Now Playing: Compact Disks on LANs 55

BY TOM McCUSKER Now CD-ROM readers can be networked, cutting cost per user. For work groups, this shared resource can bring surprising savings. But pricing schemes are still controversial.

SOFTWARE

DATABASE MANAGEMENT

Mastering the Art Of Database Fusion 61

BY EDGAR F. CODD Merging two or more independently conceived relational databases into a single one is no simple task, but every good database administrator should know how. Here's some advice from the master of relational database management.

EXPERT SYSTEMS

Users Now Hail Expert Systems Upgrade 69

BY TOM McCUSKER It wasn't exactly war, but at last year's user group meeting when Level Five Research announced plans to wipe out the old version of Level5 and replace it with a hot new upgrade, the users started shooting.

SYSTEMS

TECHNICAL COMPUTING

Shopping for Supercomputers 76

BY GORDON BELL AND GLEN MIRANKER In the market for supercomputing? Look beyond Cray supercomputers, IBM mainframes, Alliant minisupers and Digital minis. Instead, discover the power of superworkstations

TVA's Zarski, inside outsourcing, page 39.

Confusion over fusion, page 61.

Level Five's Silar, recommitted to users, page 69.

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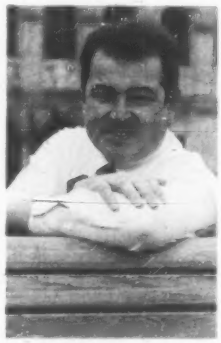
The Real Promise of the RS/6000

When IBM introduced its RS/6000 workstation family this past spring, the performance and price of the line impressed many in the IS profession. At the starting gate, the low-end POWERstation 320 is rated at 27.5 million instructions per second and priced at $12,995. That converts to $472.55 per MIPS—an aggressive price/performance point by any measure.

The combination of the machine's price/performance; its reduced instruction set computing design; and AIX, IBM's version of the UNIX operating system, has drawn the attention of computer buyers from all sectors of industry and commerce. But what perhaps makes the RS/6000 most noteworthy is not its technical achievements or its price or even the powerful benefits associated with being a machine made by the world's largest computer company. What makes the machine so interesting, and perhaps significant, is IBM's plans to integrate the computer into its vision of enterprisewide computing networks. With the RS/6000, its new System/390 large-scale systems and associated products, and with System Application Architecture, IBM is clearly attempting to craft an approach to linking various computing platforms into a rational whole.



FRANCIS: Focusing on interoperability.

We think it's important to look at the RS/6000 in this emerging context. IBM does not have all the pieces together yet—the still unclear role of AIX in SAA is but one question. But the company has been clear about its intentions. As Dallas bureau manager Bob Francis writes in this issue cover story, "Big Blue's Red Hot Workstation," page 28, The machine's "credentials combined with at least a promise of enterprisewide interoperability have IS managers looking beyond IBM's original positioning of the machine as a technical workstation. Now they're looking at the machine's potential for integration into existing corporate networks and as a platform for systems development."

Brooks Freeman, a member of the RS/6000 development team, drives the point home. "To be interoperable with the databases residing on the 3090 was essential," he says.

So as you read our story think about the larger context. It's this context that reveals the real promise of this truly red hot workstation.

You Make the Call

Over the past several years, DATAMATION has made a concerted effort to get closer to you, our reader. One of the main ways we've done this is through our coverage of user groups. Now, we're going a step further in asking you to vote for the truly significant products introduced over the past year. In our first Products of the Year Contest, page 97, we have assembled more than 100 candidates for you to choose from. Go through the descriptions in the PCs & Workstations, Networks, Software, Systems and Peripherals categories, pick your favorites and vote on the enclosed card. We'll announce the winners in our February 15, 1991 issue.

Also of particular note in this issue is the first of a two-part article by Edgar F. Codd, "Mastering the Art of Database Fusion," page 61. This paper, by the developer of Relational Model, tells you how to combine two different database systems. And C. Gordon Bell, who led the VAX development team at Digital Equipment Corp., coauthors with Glen Miranker a discussion of alternate forms of supercomputing. Check out "Shopping for Supercomputers," page 76.

David R. Brousell, Editor

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DataEase International's DataEase SQL enables users to move between databases in a client/server architecture.

SQL Server Power!

DATAEASE'S BARCA-HALL thinks DataEase SQL will tower over its competition.

BY MIKE RICCIUTI

There was a time when users wanting to pull information from vast corporate databases had to log on to the nearest mainframe or minicomputer and use cryptic programming codes—or not much less cryptic Structured Query Language (SQL), the de facto standard for relational database communications.

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PCs & WORKSTATIONS
NETWORKS
SOFTWARE
SYSTEMS
PERIPHERALS

Photograph by Bob Kunz/Black Star

PRODUCT GUIDE

But times have changed. A program recently introduced by DataEase International, called DataEase SQL, translates user-friendly queries made on a personal computer into Structured Query Language (SQL), for seamless access via a network to multiple databases on different types of machines.

Borland International Inc., Gupta Technologies Inc. and Software Publishing Corp., offer a similar class of products, but at presstime, none had moved distributed database management into a client/server environment. DataEase SQL splits up database requests from network PC users and sends them to the appropriate database server, whether the database exists on a PC, minicomputer or mainframe. Only the necessary data are then routed back to the user, minimizing network traffic.

DataEase International, based in Trumbull, Conn., is a company better known for its database management system (DBMS), DataEase, which has the PC database software world's second largest installed base, after Ashton-Tate' Corp.'s dBASE, according to the Framingham, Mass.-based market research firm International Data Corp.

DataEase SQL consists of two modules: the DataEase module, which replicates the look and feel of the company's database product for applications development and execution, and the PRISM module, which is a processing router.

The PRISM section contains drivers that tie the DataEase applications development interface to the server software of multiple databases. Through PRISM, all DataEase commands are translated, transparently to the user, into SQL statements

The initial version of DataEase SQL, shipped in September, included PRISM drivers for access to Microsoft Corp.'s SQL Server, version 1.1 or later. The company plans to release drivers over the next six months that tie the product to IBM's OS/2 Extended Edition Database Manager, Micro Decisionware Inc.'s Database Gateway for DB2 Access, Oracle Server (for UNIX and Digital VAX/VMS databases) and Teradata Corp.'s DBC/1012 database computer system. The base product price is $995. Each PRISM driver is priced at $1,500. Workstation support is priced incrementally at $1,750 for every five users.

"Our potential customers for DataEase SQL are people who want the ability to use local area network technology in the same way as mini and mainframe computers, through a client/server architecture," says Jeffrey Barca-Hall, DataEase's director of product development.

Jim Louderback, a technical manager at American Management Systems Inc., an applications consulting firm in Roseland, N.J., beta tested DataEase SQL for six months prior to its release. The firm developed a telemarketing system for 65 users based on DataEase SQL and a client/server architecture, using a Compaq 386-based personal computer as the server. "Two years ago, this type of system would have been developed on a mainframe," he says.

An important feature of the product, Louderback adds, is that it's easy to use. "I can get a system with a large number of users up and running in a very short time with DataEase SQL," he says.

Pushing SQL Into the Maintream

"Because of products like DataEase SQL, SQL database engines will enter the mainstream business market," says Marshall Mosley, a software analyst at the San Jose-based market research firm Dataquest Inc.

Adds Dataquest's Mosley: "There is only a small market for this type of product now. DataEase is betting on the future, but I think it is an extremely smart bet."

IN FOCUS

DataEase

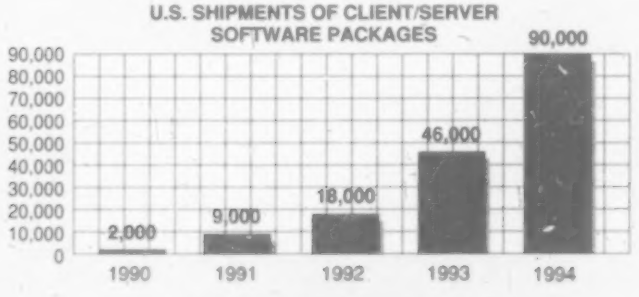
DataEase International, Inc.
Trumbull, Conn 06611
Price: $995
Circle No. 205

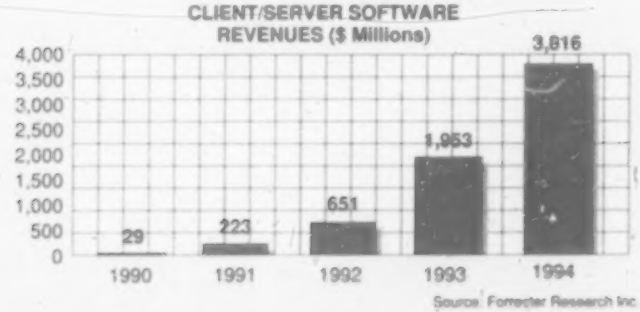
Product Features:
- Large-scale database application development on PCs
- Translates database queries into SQL
- Allows access to multiple databases
- Uses a client/server architecture

Key Benefits to IS:
- Fast system development
- Easy ties to existing databases
- Ease of use
- No need to use "C" code

Client/Server Software Picks Up Momentum

The market for client/server software is small today but is projected to grow 45-fold in the next five years.





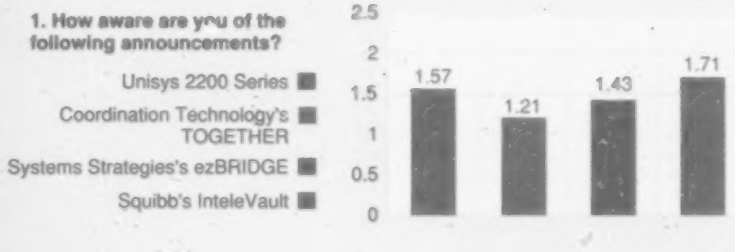
Source: Forrester Research Inc.

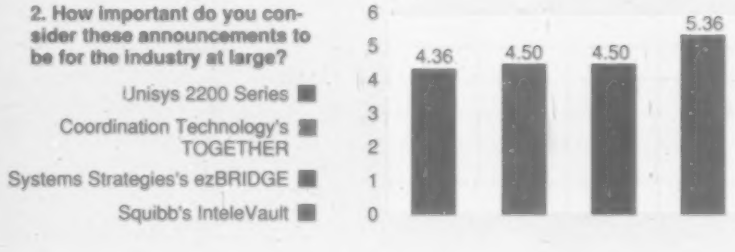
Squibb's InteleVault Locks Up Top Spot

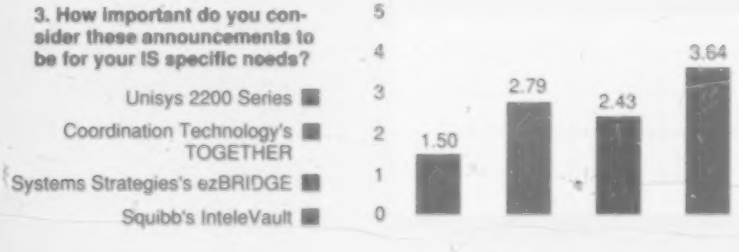
DATAMATION'S USER PRODUCT REVIEW

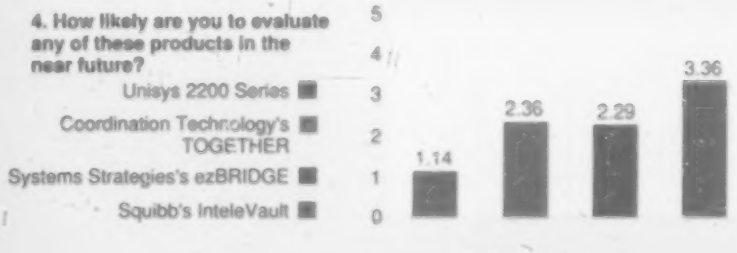
Pick of the Pack

The DATAMATION Review Panel was asked the following four questions for each product. Panel members were asked to respond on a scale of 1 to 10, with 1 meaning ""not very" and 10 meaning ""extremely." The results represent the average of all responses for each question.









The Lineup

Unisys Corp., of Blue Bell, Pa., announced new mainframe computers in July, including three new series—the A16, the 2200/600 Evolutionary System and the 2200/100 series—as well as four new models in the existing A12 series. Prices begin at $115,000.
Circle No. 270

In June **Coordination Technology Inc.**, based in Trumbull, Conn., announced TOGETHER, a groupware software product for networked personal computers. TOGETHER runs on top of network software and lets users share work and send and receive messages in a client/server environment. The product is priced from $9,995.
Circle No. 271

Squibb DataSafe Systems Inc. of Kingston, N.Y., announced the InteleVault off-site backup service in July. The company says the service allows companies to store large amounts of data off site via telephone line. The price of the service begins at less than $2 per day, the company says, and is based on the volume of data stored.
Circle No. 272

Systems Strategies Inc., a NYNEX company based in New York City, announced the ezBRIDGE Peer-to-Peer Productivity Tools in July. The software tool package provides communications services to developers building multivender LU6.2 applications on Digital VAX/VMS systems and on IBM AS/400 systems. Prices begin at $15,000.
Circle No. 273

DATAMATION's User Product Review is conducted twice a month by a panel of the magazine's readers. Panel members base their judgments on published information about each of the products under review. Their responses are sent to DATAMATION by fax. If you wish to join DATAMATION's User Product Review Panel, call Bob Sawyer, Senior Editor, New Products, at (617)-558-4458; write to him at 275 Washington St., Newton, MA 02158; or, of course, you can fax him at (617)-558-4506.

Service Sector Keeps on Chugging

Editor's Note: Market Insights is a new department in DATAMATION that will be appearing every issue. On the first of each month, Cahners Economics will provide the results of the new DATAMATION IS Performance Indicator, which is intended to track the economic health of the industry. On the 15th of each month, we will track macroeconomic trends. On the following page in each issue, Cahners Business Research Group will provide the results of surveys of DATAMATION readers. These surveys will examine how user organizations are implementing new technologies.

BY MADELINE FRANCHI
Cahners Economics

Amid seemingly constant reports of yet another savings and loan in trouble, another investment firm announcing layoffs or another condominium project going belly up, it's easy to come away with the impression that the U.S. service sector is in trouble. The fact is, though, that the sector remains the fastest-growing segment of the U.S. economy. The news of the day, however, is reflected in projections that the sector will grow at a slightly slower pace in 1990 than it did in 1989. Cahners Economics expects consumer spending on all services to grow at an inflation-adjusted rate of 2.5% in 1990, down from 1989's 3.7%, but higher than the rate of consumer spending for both durable and nondurable goods.

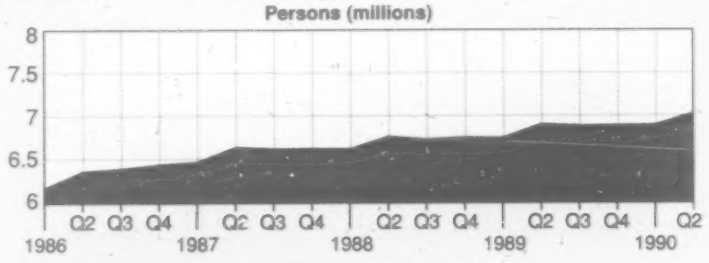
And, despite the S&L nightmare and shrinkage in the banking and brokerage industries, employment in the finance, insurance and real estate sector (including IS employees working for those financial institutions) is at a record level.

As of June 1990, 7 million persons held jobs in the financial services industry, the highest monthly level ever recorded and 1.8% more than in June 1989. More bodies usually means more demand on the IS department, a fact underscored by figures showing that employment at computer vendors was a healthy 7.9% higher in June 1990 than it was in June 1989.

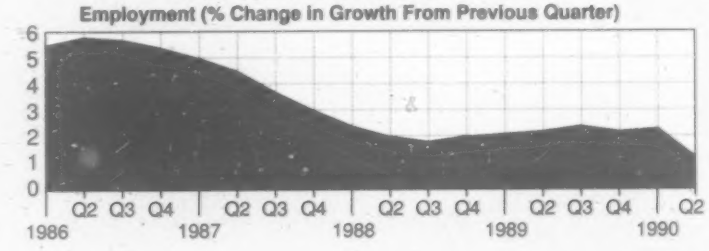
For more information on Cahners Economics's forecasting services, contact Dan Buchanan at (617)-630-2105, by fax at (617)-630-2100 or write to him at Cahners Economics, 275 Washington Street, Newton, MA 02158.

A Macroeconomic View of the U.S. Service Sector

Employment in the Finance, Insurance and Real Estate Sector Is Still Heading Up...



But Not as Fast as in Previous Years



	Annualized % growth		Annual % growth		
	Q1/90	Q2/90	1990	1991	1992
Gross National Product	1.7	1.2	1.4	2.3	2.2
Business Investment in Equipment	5.7	-6.2	1.5	4.6	3.3
Government Spending	2.9	6.2	2.0	1.3	0.5
Consumer Spending	1.1	-0.3	1.0	2.0	2.1
Exports	11.2	-3.7	6.0	3.3	4.7
Imports	2.5	3.2	3.5	2.2	2.9

All calculations are in 1982 dollars; quarterly figures are seasonally adjusted.

Source: Commerce Dept. and Cahners Economics

	June	May	% Change	June 1989	% Change
Manufacturing Production (1)					
Process Industries Total	108.5	107.6	0.8	107.6	0.8
Chemicals	110.5	109.5	0.9	109.1	1.3
Petroleum	108.6	106.3	2.2	106.6	1.9
OEM Total	115.1	114.2	0.8	113.2	1.7
Computers & Peripherals	148.2	149.0	-0.5	139.1	6.5
Communication Equipment	110.6	109.0	1.5	106.0	4.3
Transportation Equipment	111.4	109.1	2.1	109.0	2.2
Services Employment (2)					
Finance, Insurance, Real Estate	7.003	6.928	1.1	6.878	1.8
Health Care	8.209	8.120	1.1	7.646	7.4
Computer & Data Processing	0.820	0.813	0.9	0.760	7.9
Transportation/Utilities	5.948	5.896	0.9	5.753	3.4
Retail Trade	19.996	19.825	0.9	19.727	1.4
Wholesale Trade	6.390	6.343	0.7	6.266	2.0
Government	18.494	18.832	-1.8	17.792	3.9

(1) Index 1978–100, seasonally adjusted
(2) Millions of persons, not seasonally adjusted

Who Cares About This Networking Standard?

BY WARREN CHILDS
Business Research Group

As sharing information becomes increasingly important, users are seeking ways to integrate their disparate multivendor systems. One solution to this integration problem is the Open Systems Interconnection (OSI) standard. The implementation of OSI-compliant products would allow users to integrate computing resources from a number of vendors. But users are approaching OSI-compliant products cautiously. This caution is born partly out of concern that OSI products from different vendors may still be incompatible. But, more important, investments in proprietary systems are too great for many users to risk the expense and training involved in implementing an unproven standard.

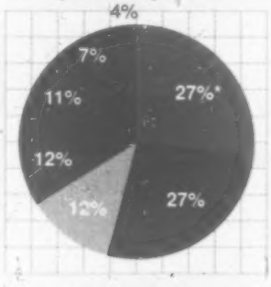
The results of the DATAMATION High-Technology Panel survey reflect the cautious approach many are taking toward OSI implementation. Only 25% of panel members have implemented OSI-compliant products. Less than half expect to implement any OSI products by 1993.

With less than one-third of the panel members planning to require OSI compliance, vendors with large installed bases of proprietary systems may see little incentive to become fully compliant with the OSI standard.

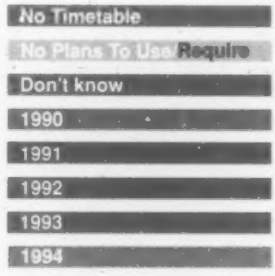
Most Users Show Little Interest in OSI

Today: 75% of respondents have not implemented any OSI-compliant products.

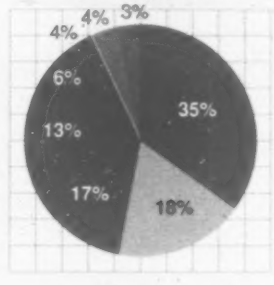
Tomorrow: 49% of respondents expect to implement some products by 1993.



*Includes those already using OSI products



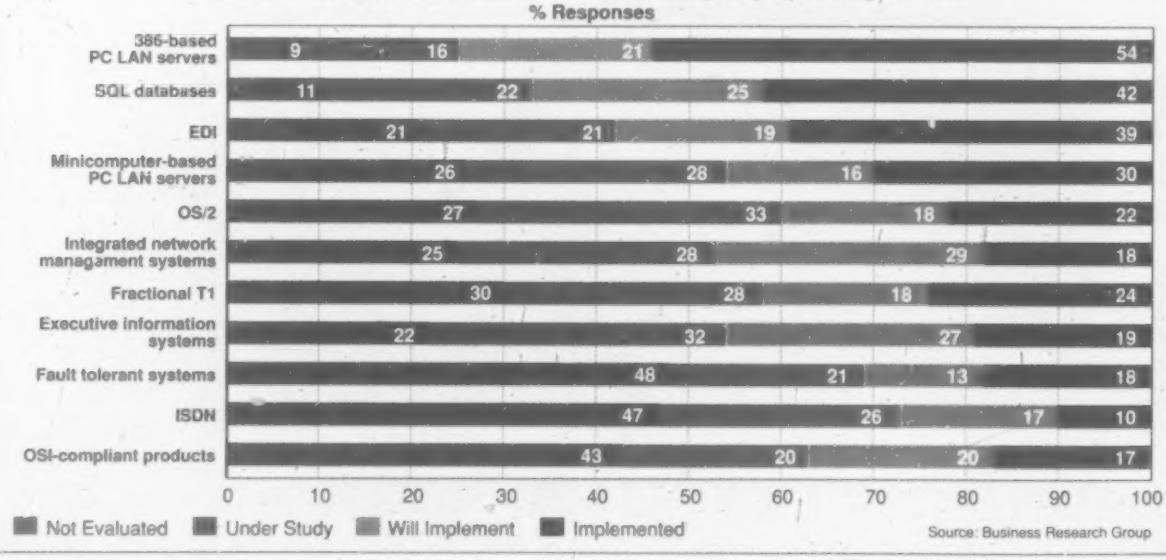
The Problem: More than 50% have no plans to require OSI compliance.



Source: Business Research Group

DATAMATION's Technology Implementation Index

DATAMATION each month surveys a select group of its readers–the DATAMATION High Technology Panel–to investigate the implementation of new technologies by key user organizations.



Source: Business Research Group